
In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

In light of the fact that brackets were used in many of the chemical formulas, the ability to show the examiner which parts of the claim were being amended was not possible. Therefore, please delete claims 42-82 and a new set of claims is being provided consecutively numbered 83-123. Support for these new claims can be found in the originally submitted claims and with reference to the examples found on pages 7-9 of the application as originally filed.

1-41. (previously deleted)

42-82. (deleted)

83. (new) A stabilized composition comprising:

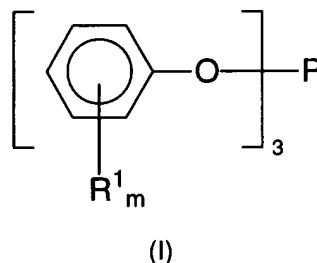
- (a) a halogenated resin;
 - (b) a phosphite ester additive which comprises at least one phosphite ester selected from the group consisting of
 - (i) triaryl phosphites and C₁₋₉ alkyl substituted derivatives thereof,
 - (ii) C₈₋₁₅ alkyl phosphites,
 - (iii) mixed phosphites having at least one C₈₋₁₅ alkyl moiety and at least one aryl moiety therein, a combination of said moieties totaling three,
 - (iv) C₁₀₋₁₅ alkyl bisphenol-A phosphites,
 - (v) poly- and mono- alkylene glycol phosphites,
 - (vi) C₈₋₁₅ pentaerythritol phosphites,
 - (vii) mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites, and
 - (viii) blends thereof; and
 - (c) a zinc additive comprising approximately 50 to 800 ppm zinc.
84. (represented – formally dependent claim 43) The composition of claim 83 wherein
- (a) said zinc is from approximately 100 to 500 ppm.

85. (represented – formally dependent claim 44) The composition of claim 84 wherein

(a) said zinc is from approximately 100 to 250 ppm.

86. (new) The composition of claim 83 wherein said at least one phosphite ester is selected from the group consisting of

triaryl phosphites and C₁₋₉ alkyl substituted derivatives thereof of formula (I)

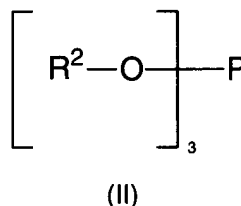


wherein

R¹ is independently selected from the group consisting of H and C₁₋₉ alkyl, and

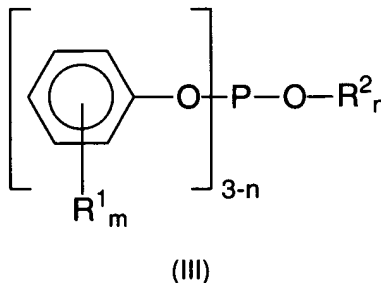
m is an integral value from 0 to 1 inclusive,

C₈₋₁₅ trialkyl phosphites of formula (II)



wherein

R² is selected from the group consisting of C₈₋₁₅ alkyl, mixed phosphites having at least one C₈₋₁₅ alkyl moiety and at least one aryl moiety of formula (III)



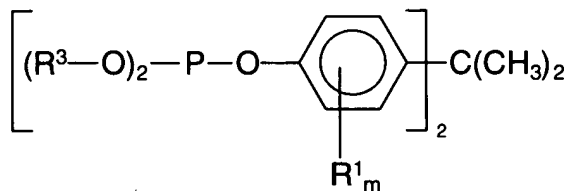
wherein

R¹ is as previously defined,

R² is as previously defined,

m is as previously defined, and

n is an integral value from 1 to 2,
C₁₀₋₁₅ alkyl bisphenol-A phosphites of formula (IV)



(IV)

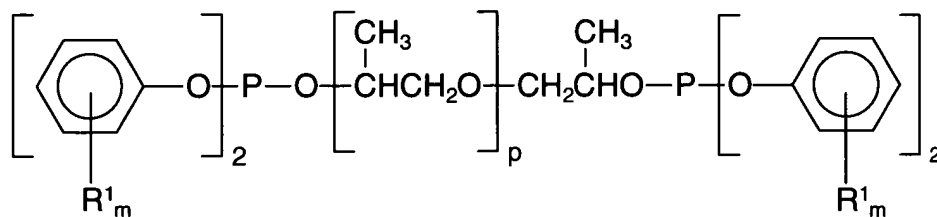
wherein

R¹ is as previously defined,

R³ is C₁₀₋₁₅ alkyl, and

m is as previously defined,

poly- and mono- alkylene glycol phosphites of formula (V)



(V)

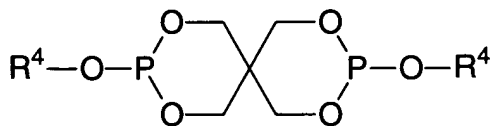
wherein

R¹ is as previously defined,

m is as previously defined, and

p is an integral value from 0 to 1 inclusive,

C₈₋₁₅ pentaerythritol phosphites of formula (VI)

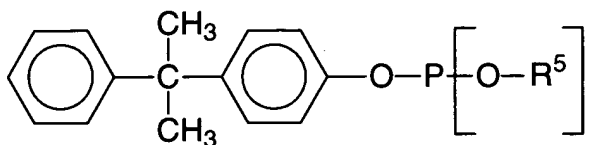


(VI)

wherein

R⁴ is the same as R¹, and

mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites and C₁₋₄ alkyl substituted derivatives thereof of formula (VII)



(VII)

wherein
R⁵ is the same as R¹.

87. (new) The composition of claim 86 wherein

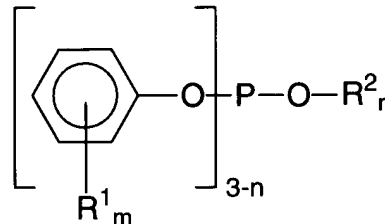
(a) a percentage weight loss of said phosphite ester additive and said zinc additive as measured as a difference between a start and an end weight of said phosphite ester additive and zinc additive as measured after exposure to two hours at 110°C, is less than 1% by weight.

88. (represented – formally dependent claim 47) The composition of claim 87 wherein

(a) a percentage weight loss is less than 0.5% by weight.

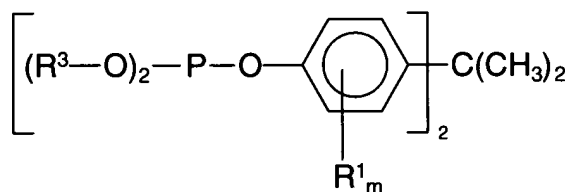
89. (new) The composition of claim 88 wherein said at least one phosphite ester is selected from the group consisting of

mixed phosphites having at least one C₈₋₁₅ alkyl moiety and at least one aryl moiety of formula (III)



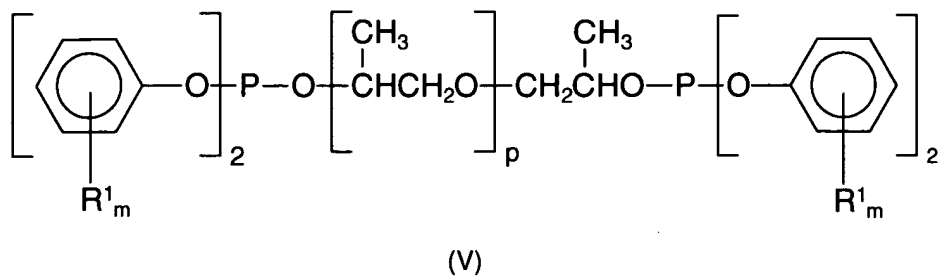
(III)

C₁₀₋₁₅ alkyl bisphenol-A phosphites of formula (IV)

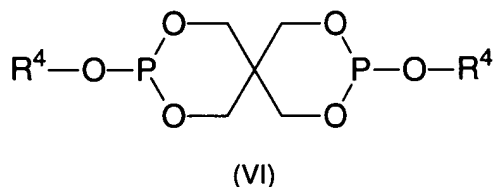


(IV)

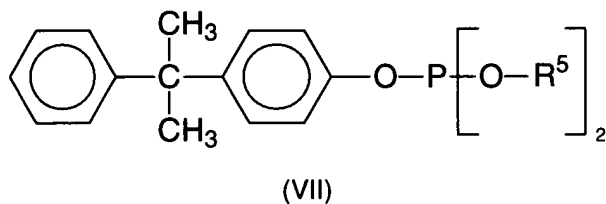
poly- and mono- alkylene glycol phosphites of formula (V)



C₈₋₁₅ pentaerythritol phosphites of formula (VI)



mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites and C₁₋₄ alkyl substituted derivatives thereof of formula (VII)

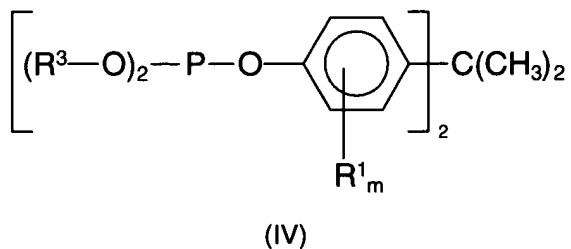


wherein

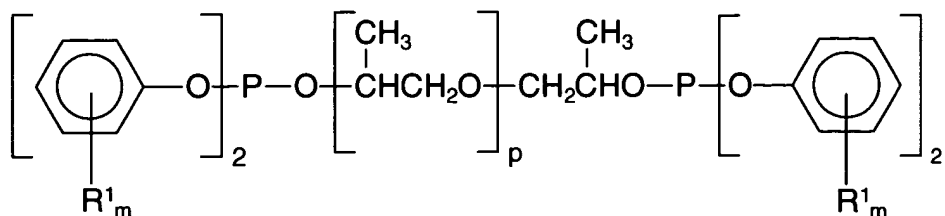
R¹, R², R³, R⁴, R⁵, m, n and p are as previously defined.

90. (new) The composition of claim 89 wherein said at least one phosphite ester is selected from the group consisting of

C₁₀₋₁₅ alkyl bisphenol-A phosphites of formula (IV)

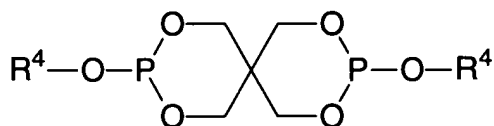


poly- and di- alkylene glycol phosphites of formula (V)



(V)

C₈₋₁₅ pentaerythritol phosphites of formula (VI)



(VI)

wherein

R¹, R³, R⁴, m and p are as previously defined.

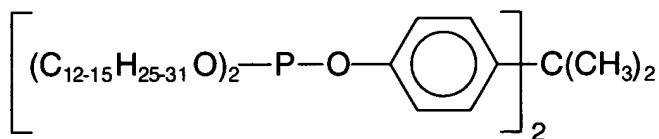
91. (represented – formally dependent claim 50) The composition of claim 90 wherein

(a) said composition is essentially free of barium, cadmium and calcium.

92. (represented – formally dependent claim 51) The composition of claim 89 wherein

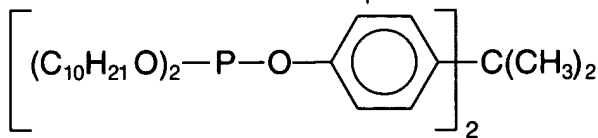
(a) said phosphite ester is selected from the group consisting of

C₁₂₋₁₅ bisphenol-A phosphite of formula (VIII)



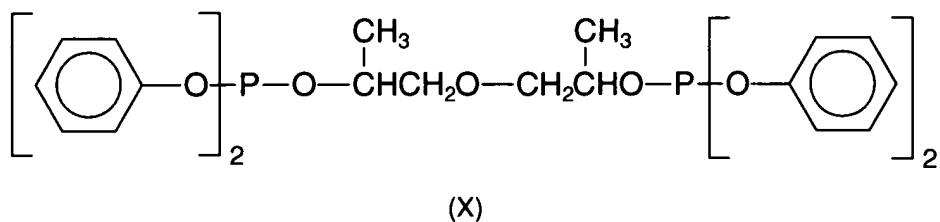
(VIII)

C₁₀ bisphenol-A phosphite of formula (IX)

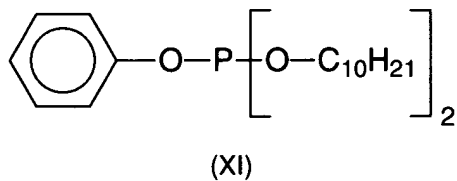


(IX)

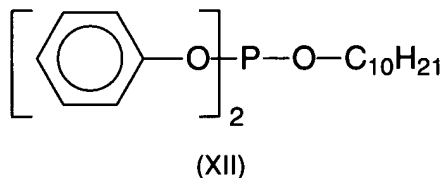
tetraphenyl dipropylene glycol diphosphite of formula (X)



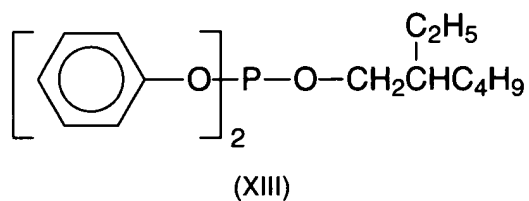
phenyl diisodecyl phosphite of formula (XI)



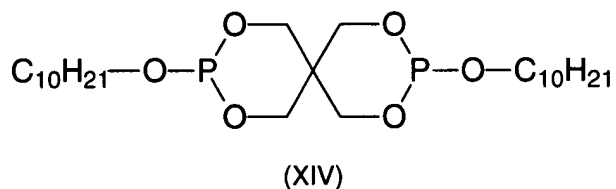
diphenyl isodecyl phosphite of formula (XII)



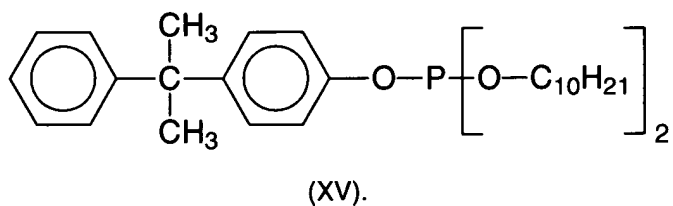
diphenyl 2-ethylhexyl phosphite of formula (XIII)



diisodecyl PE diphosphite of formula (XIV), and



mono *p*-cumyl phenol diisodecyl phosphite of formula (XV)

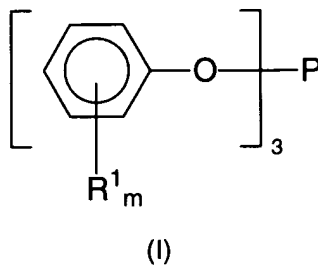


93. (new) A resin composition comprising:

(a) a halogenated resin;

- (b) at least one phosphite ester additive selected from the group consisting of
- (i) triaryl phosphites and C₁₋₉ alkyl substituted derivatives thereof,
 - (ii) C₈₋₁₅ alkyl phosphites,
 - (iii) mixed phosphites having at least one C₈₋₁₅ alkyl moiety and at least one aryl moiety therein, a combination of said moieties totaling three,
 - (iv) C₁₀₋₁₅ alkyl bisphenol-A phosphites,
 - (v) poly- and mono- alkylene glycol phosphites,
 - (vi) C₈₋₁₅ pentaerythritol phosphites,
 - (vii) mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites, and
 - (viii) blends thereof;
- (c) a zinc additive comprising approximately 50 to 800 ppm zinc; and
- (d) a molar ratio of P/Zn of about 80:1 to 4:1.
94. (represented – formally dependent claim 53) The composition of claim 93 wherein
- (a) said zinc is from approximately 100 to 500 ppm; and
 - (b) said molar ratio of P/Zn is about 75:1 to 6:1.
95. (represented – formally dependent claim 54) The composition of claim 94 wherein
- (a) said zinc is from approximately 100 to 250 ppm; and
 - (b) said molar ratio of P/Zn is about 73:1 to 8:1.
96. (new) The composition of claim 93 wherein said at least one phosphite ester is selected from the group consisting of

triaryl phosphites and C₁₋₉ alkyl substituted derivatives thereof of formula (I)

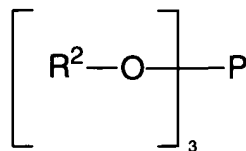


wherein

R¹ is independently selected from the group consisting of H
and C₁₋₉ alkyl, and

m is an integral value from 0 to 1 inclusive,

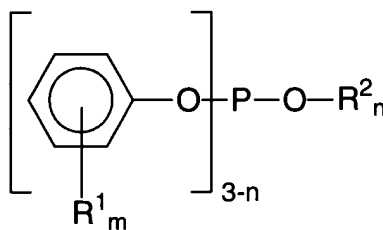
C₈₋₁₅ trialkyl phosphites of formula (II)



(II)

wherein

R^2 is selected from the group consisting of C_{8-15} alkyl, mixed phosphites having at least one C_{8-15} alkyl moiety and at least one aryl moiety of formula (III)



(III)

wherein

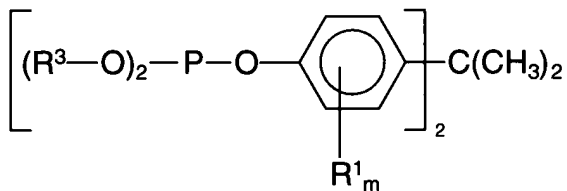
R^1 is as previously defined,

R^2 is as previously defined,

m is as previously defined, and

n is an integral value from 1 to 2,

C_{10-15} alkyl bisphenol-A phosphites of formula (IV)



(IV)

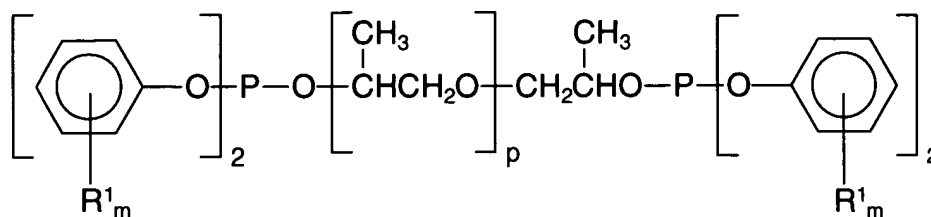
wherein

R^1 is as previously defined,

R^3 is C_{10-15} alkyl, and

m is as previously defined,

poly- and di- alkylene glycol phosphites of formula (V)

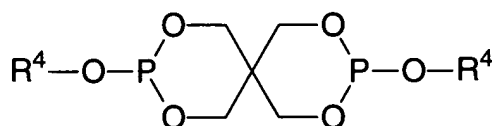


(V)

wherein

- R¹ is as previously defined,
 m is as previously defined, and
 p is an integral value from 0 to 1 inclusive,

C₈₋₁₅ pentaerythritol phosphites of formula (VI)

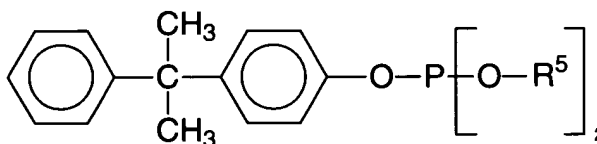


(VI)

wherein

- R⁴ is the same as R¹, and

mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites and C₁₋₄ alkyl substituted derivatives thereof of formula (VII)



(VII)

wherein

- R⁵ is the same as R¹.

97. (new) The composition of claim 96 wherein

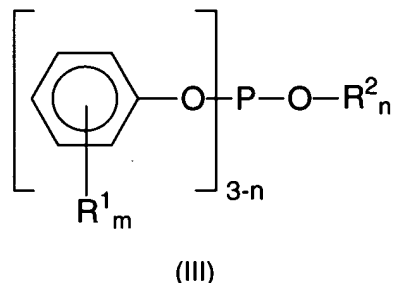
- (a) a percentage weight loss of said phosphite ester additive and said zinc additive as measured as a difference between a start and an end weight of said phosphite ester additive and said zinc additive as measured after exposure to two hours at 110°C, is less than 1% by weight.

98. (represented – formally dependent claim 57) The composition of claim 97 wherein

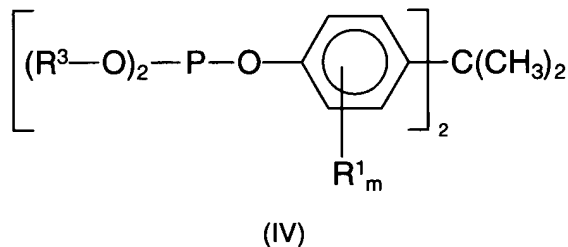
(a) a percentage weight loss is less than 0.5% by weight.

99. (new) The composition of claim 98 wherein said at least one phosphite ester is selected from the group consisting of

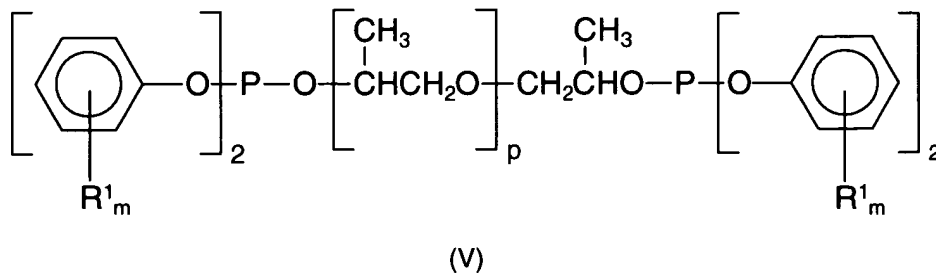
mixed phosphites having at least one C₈₋₁₅ alkyl moiety and at least one aryl moiety of formula (III)



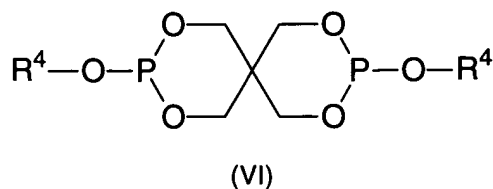
C₁₀₋₁₅ alkyl bisphenol-A phosphites of formula (IV)



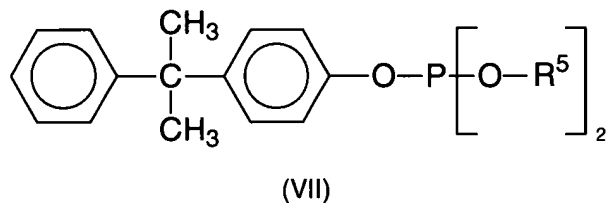
poly- and di- alkylene glycol phosphites of formula (V)



C₈₋₁₅ pentaerythritol phosphites of formula (VI)



mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites and C₁₋₄ alkyl substituted derivatives thereof of formula (VII)

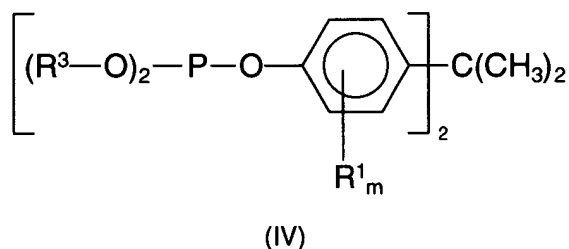


wherein

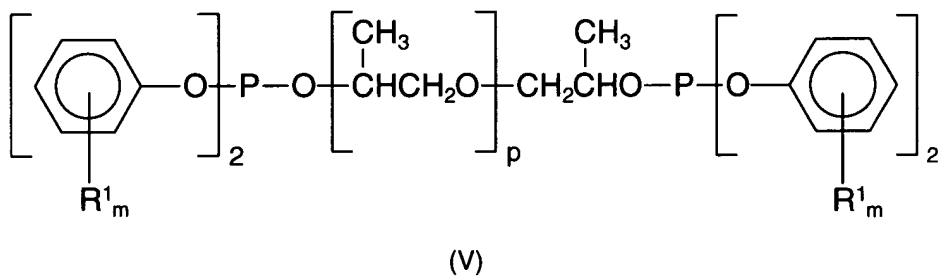
R¹, R², R³, R⁴, R⁵, m, n and p are as previously defined.

100. (new) The composition of claim 99 wherein said at least one phosphite ester is selected from the group consisting of

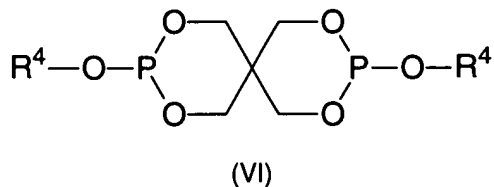
C₁₀₋₁₅ alkyl bisphenol-A phosphites of formula (IV)



poly- and di- alkylene glycol phosphites of formula (V)



C₈₋₁₅ pentaerythritol phosphites of formula (VI)



wherein

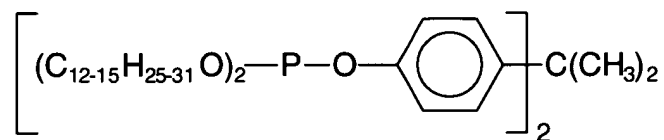
R¹, R³, R⁴, m and p are as previously defined.

101. (represented – formally dependent claim 60) The composition of claim 100 wherein said composition is essentially free of barium, cadmium and calcium.

102. (represented – formally dependent claim 61) The composition of claim 99 wherein

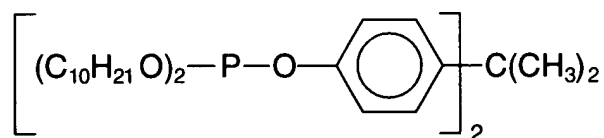
(a) said phosphite ester is selected from the group consisting of

C₁₂₋₁₅ bisphenol-A phosphite of formula (VIII)



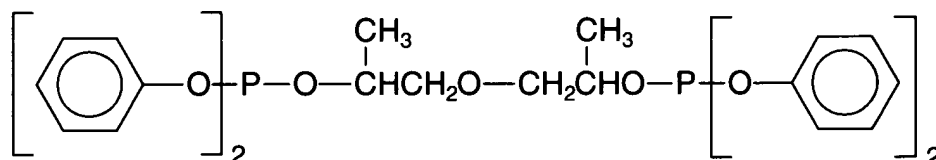
(VIII)

C₁₀ bisphenol-A phosphite of formula (IX)



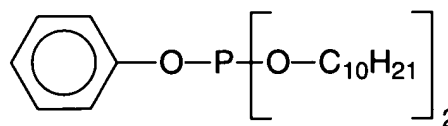
(IX)

tetraphenyl dipropylene glycol diphosphite of formula (X)



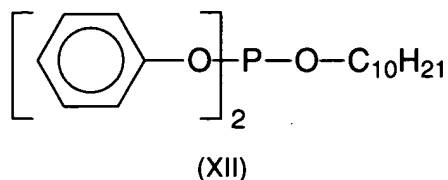
(X)

phenyl diisodecyl phosphite of formula (XI)

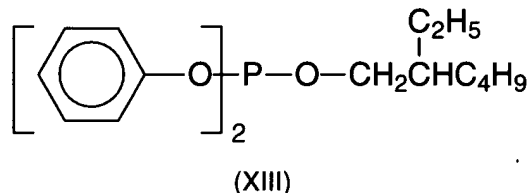


(XI)

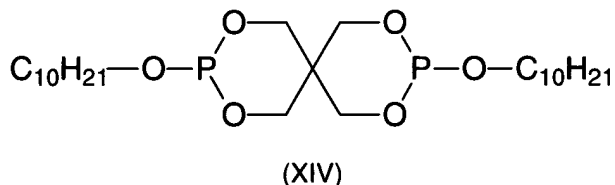
diphenyl isodecyl phosphite of formula (XII)



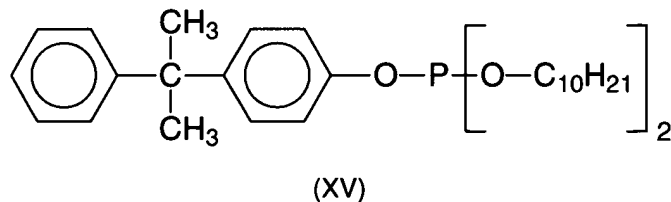
diphenyl 2-ethylhexyl phosphite of formula (XIII)



diisodecyl PE diphosphite of formula (XIV) and



mono *p*-cumyl phenol diisodecyl phosphite of formula (XV)

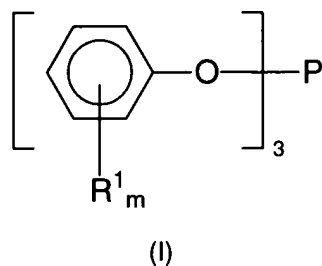


103. (new) An essentially toxic-metal free liquid additive composition for use as at least a partial replacement of toxic metal stabilizer additive compositions for use in vinyl-containing resins, wherein the essentially toxic-free composition consists essentially of:

(a) at least one phosphite ester selected from the group consisting of

- (i) triaryl phosphites and C₁₋₉ alkyl substituted derivatives thereof,
- (ii) C₈₋₁₅ alkyl phosphites,
- (iii) mixed phosphites having at least one C₈₋₁₅ alkyl moiety and at least one aryl moiety therein, a combination of said moieties totaling three,
- (iv) C₁₀₋₁₅ alkyl bisphenol-A phosphites,
- (v) poly- and mono- alkylene glycol phosphites,
- (vi) C₈₋₁₅ pentaerythritol phosphites,
- (vii) mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites, and

- (viii) blends thereof;
- (b) 0.05 to 0.4 mole percent zinc; and
- (c) 4 to 10 mole percent phosphorus.
104. (new) The composition of claim 103 wherein
- (a) said zinc is from 0.1 to 0.3 mole percent; and
- (b) said phosphorus is from 5 to 8 mole percent.
105. (new) The composition of claim 104 wherein
- (a) said zinc is from 0.15 to 0.25 mole percent zinc; and
- (b) said phosphorus is from 6 to 7 mole percent.
106. (new) The composition of claim 105 wherein said at least one phosphite ester is selected from the group consisting of
- trialkyl phosphites and C₁₋₉ alkyl substituted derivatives thereof of formula (I)

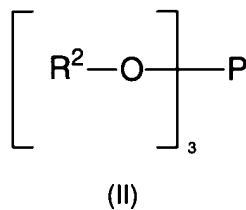


wherein

R¹ is independently selected from the group consisting of H
and C₁₋₉ alkyl, and

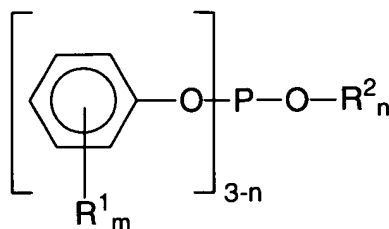
m is an integral value from 0 to 1 inclusive,

C₈₋₁₅ trialkyl phosphites of formula (II)



wherein

R² is selected from the group consisting of C₈₋₁₅ alkyl,
mixed phosphites having at least one C₈₋₁₅ alkyl moiety and at least one aryl moiety of
formula (III)



(III)

wherein

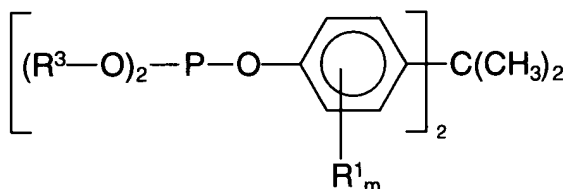
R^1 is as previously defined,

R^2 is as previously defined,

m is as previously defined, and

n is an integral value from 1 to 2,

C_{10-15} alkyl bisphenol-A phosphites of formula (IV)



(IV)

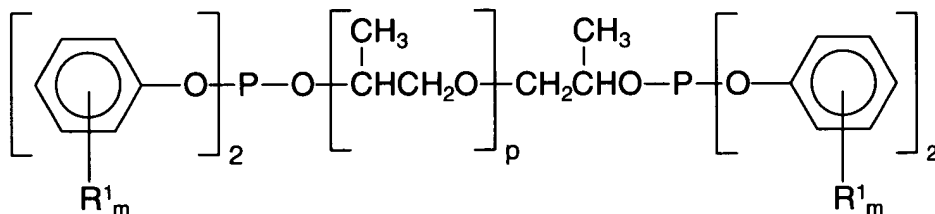
wherein

R^1 is as previously defined;

R^3 is C_{10-15} alkyl; and

m is as previously defined,

Poly- and di- alkylene glycol phosphites of formula (V)



(V)

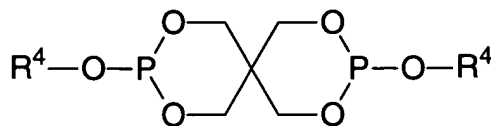
wherein

R^1 is as previously defined;

m is as previously defined; and

p is an integral value from 0 to 1 inclusive,

C_{8-15} pentaerythritol phosphites of formula (VI)

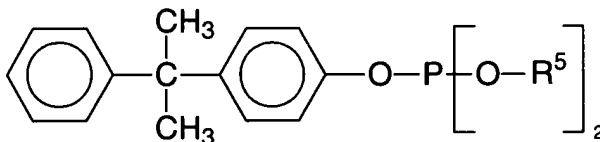


(VI)

wherein

R^4 is the same as R^1 , and

mono- and di- C_{8-15} alkyl *p*-cumyl phenol phosphites and C_{1-4} alkyl substituted derivatives thereof of formula (VII)



(VII)

wherein

R^5 is the same as R^1 .

107. (represented – formally dependent claim 66) The composition of claim 106 wherein

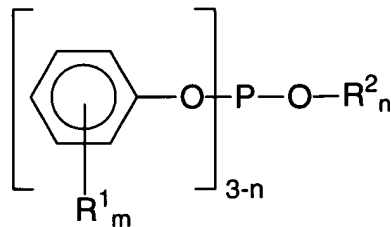
- (a) a percentage weight loss of said composition as measured as a difference between a start and an end weight of said composition as measured after exposure to two hours at 110°C, is less than 1% by weight.

108. (represented – formally dependent claim 67) The composition of claim 107 wherein

- (a) a percentage weight loss is less than 0.5% by weight.

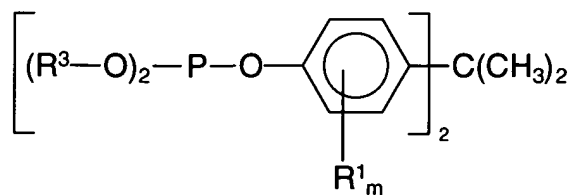
109. (new) The composition of claim 108 wherein said at least one phosphite ester is selected from the group consisting of

mixed phosphites having at least one C_{8-15} alkyl moiety and at least one aryl moiety of formula (III)

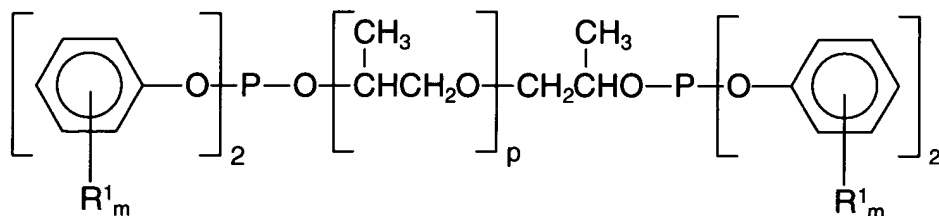


(III)

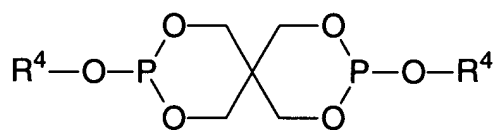
C_{10-15} alkyl bisphenol-A phosphites of formula (IV)



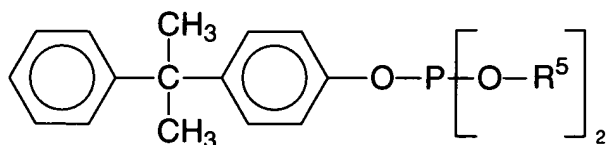
poly- and di- alkylene glycol phosphites of formula (V)



C₈₋₁₅ pentaerythritol phosphites of formula (VI)



mono- and di- C₈₋₁₅ alkyl *p*-cumyl phenol phosphites and C₁₋₄ alkyl substituted derivatives thereof of formula (VII)

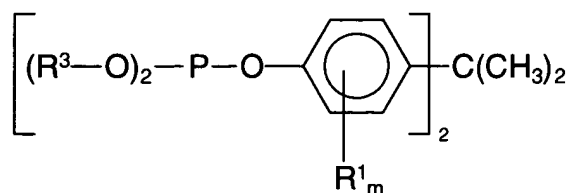


wherein

R¹, R², R³, R⁴, R⁵, m, n and p are as previously defined.

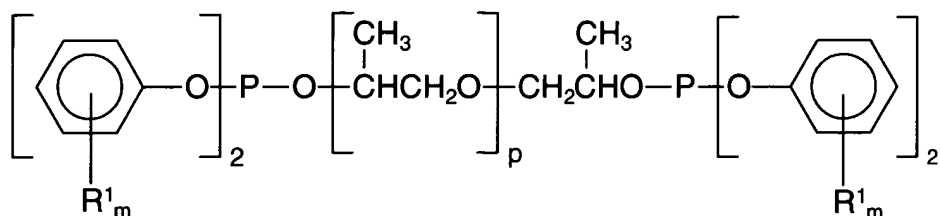
110. (new) The composition of claim 109 wherein said at least one phosphite ester is selected from the group consisting of

C₁₀₋₁₅ alkyl bisphenol-A phosphites of formula (IV)



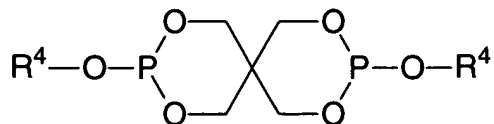
(IV)

poly- and di- alkylene glycol phosphites of formula (V)



(V)

C₈₋₁₅ pentaerythritol phosphites of formula (VI)



(VI)

wherein

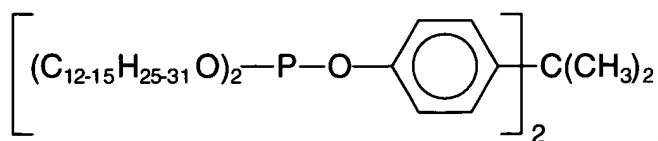
R¹, R³, R⁴, m and p are as previously defined.

111. (represented – formally dependent claim 70) The composition of claim 110 wherein said composition is essentially free of barium, cadmium and calcium.

112. (new) The composition of claim 109 wherein

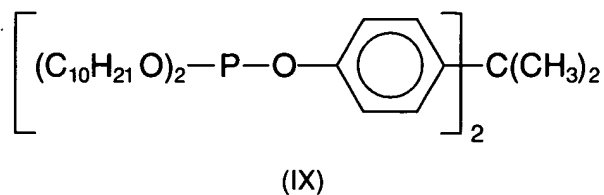
(a) said phosphite ester is selected from the group consisting of

C₁₂₋₁₅ bisphenol-A phosphite of formula (VIII)

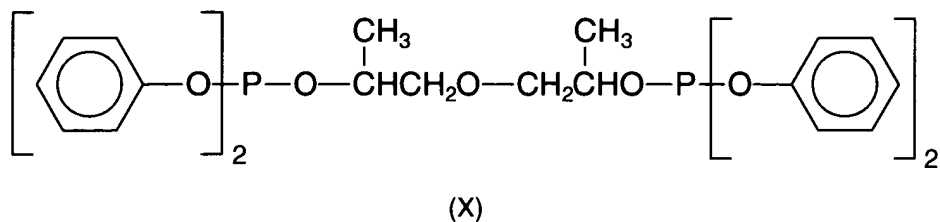


(VIII)

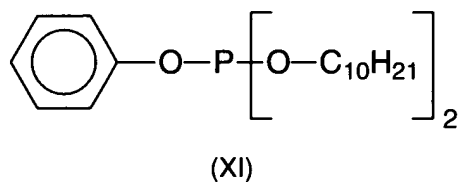
C₁₀ bisphenol-A phosphite of formula (IX)



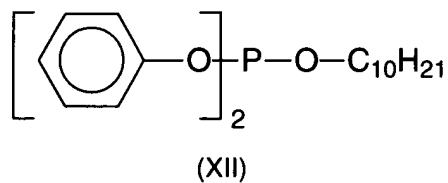
tetraphenyl dipropylene glycol diphosphite of formula (X)



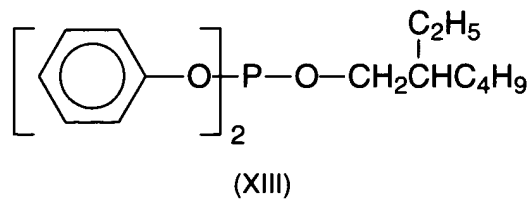
phenyl diisodecyl phosphite of formula (XI)



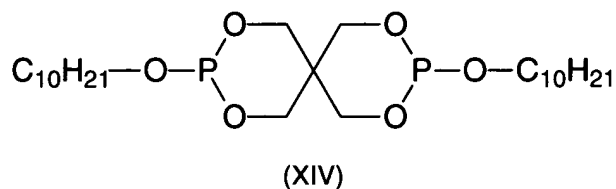
diphenyl isodecyl phosphite of formula (XII)



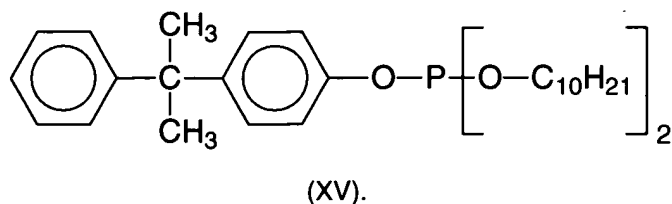
diphenyl 2-ethylhexyl phosphite of formula (XIII)



diisodecyl PE diphosphite of formula (XIV), and

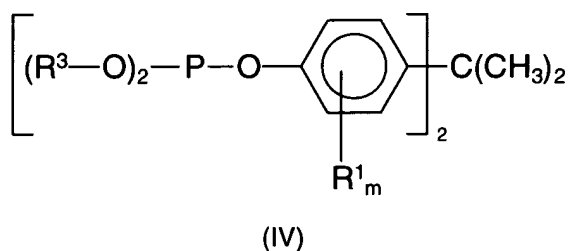


mono *p*-cumyl phenol diisodecyl phosphite of formula (XV)



113. (new) An additive composition for polyvinyl chloride resin which consists essentially of:

- (a) at least one phosphite ester selected from the group consisting of
 C_{10-15} alkyl bisphenol-A phosphites of formula (IV)



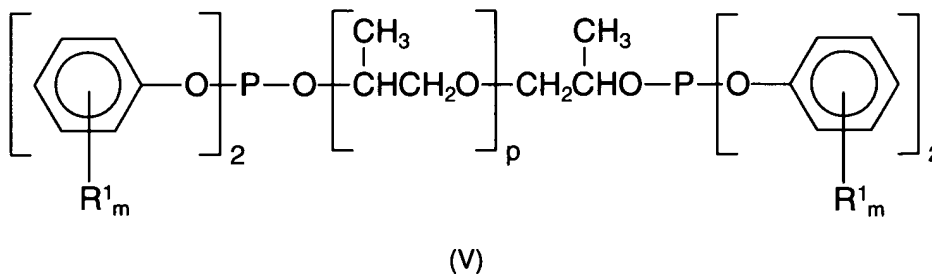
wherein

R^1 is independently selected from the group consisting of H
 and C_{1-9} alkyl,

R^3 is C_{10-15} alkyl, and

m is an integral value from 0 to 1 inclusive,

poly- and di- alkylene glycol phosphites of formula (V)



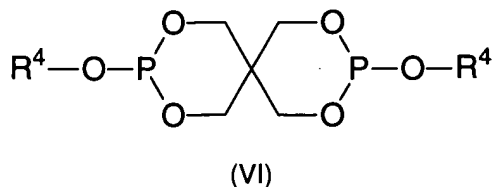
wherein

R^1 is as previously defined;

m is as previously defined; and

p is an integral value from 0 to 1 inclusive,

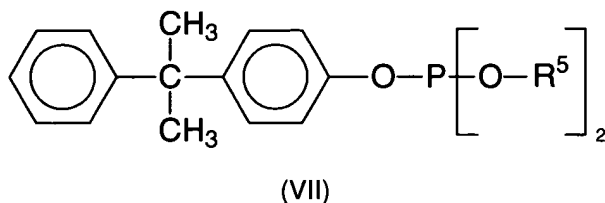
C_{8-15} pentaerythritol phosphites of formula (VI)



wherein

R^4 is the same as R^1 , and

mono- and di- C_{8-15} alkyl *p*-cumyl phenol phosphites and C_{1-4} alkyl substituted derivatives thereof of formula (VII)

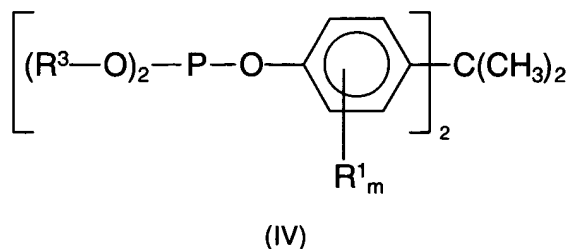


wherein

R^5 is the same as R^1 ; and

- (b) zinc wherein a molar ratio of P/Zn ranges from 80:1 to 4:1.
114. (new) The composition of claim 113 wherein
- (a) said molar ratio of P/Zn ranges from 75:1 to 6:1; and
- (b) said zinc is a zinc carboxylate.
115. (new) The composition of claim 114 wherein
- (a) said molar ratio of P/Zn ranges from 73:1 to 8:1; and
- (b) said zinc carboxylate is selected from the group consisting of zinc octoate, zinc 2-ethylhexoate, zinc hexoate, zinc neodecoate, zinc decoate, zinc dodecanoate, zinc isostearate, zinc oleate, zinc stearate, zinc tallow fatty acids, zinc palmitate, zinc myristate, zinc laurate, and zinc benzoate.
116. (new) The composition of claim 115 wherein
- (a) said composition is substantially free of any other metallic stabilizer components.
117. (new) The composition of claim 116 wherein
- (a) said phosphite is selected from the group consisting of

C₁₀₋₁₅ alkyl bisphenol-A phosphites of formula (IV)



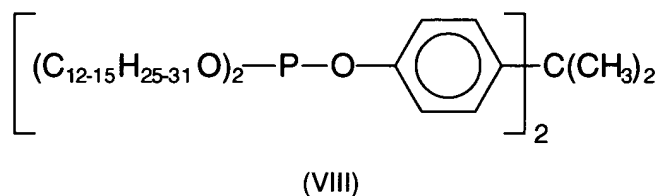
wherein

R¹, R³, and m are as previously defined.

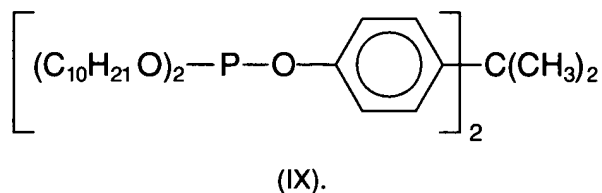
118. (new) The composition of claim 117 wherein

(a) said phosphite ester is selected from the group consisting of

C₁₂₋₁₅ bisphenol-A phosphite of formula (VIII) and



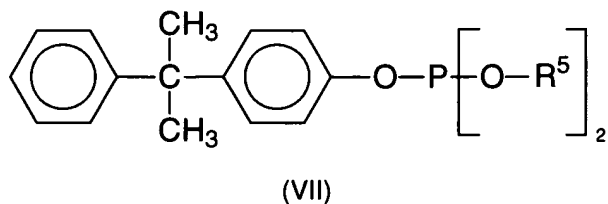
C₁₀ bisphenol-A phosphite of formula (IX)



119. (represented – formally dependent claim 78) The composition of claim 113 wherein

(a) said phosphite ester is

p-cumyl phenol phosphite is of formula (VII)

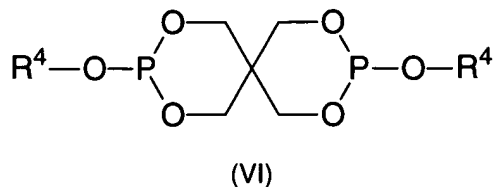


wherein

R⁵ is as previously defined.

120. (new) The composition of claim 113 wherein

- (a) said phosphite is selected from the group consisting of
 pentaerythritol phosphite of formula (VI)

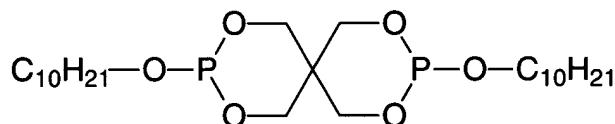


wherein

R^4 is as previously defined.

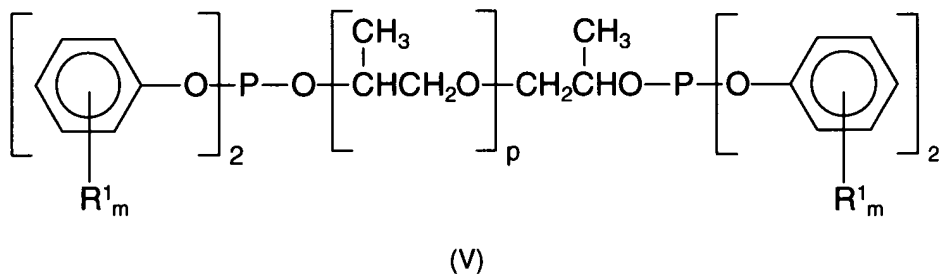
121. (represented – formally dependent claim 80) The composition of claim 120 wherein

- (a) said phosphite is



122. (new) The composition of claim 113 wherein

- (a) said phosphite ester is a
 poly- and di-alkylene glycol phosphites of formula (V)



wherein

R^1 , m , and p are as previously defined.

123. (new) The composition of claim 122 wherein

- (a) said polydialkylene glycol phosphite is selected from the group consisting of

